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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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09/596,892 06/19/00 CHOW

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EXAMINER

IM22/0806

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ART UNIT

PAPER NUMBER

1754

DATE MAILED:

08/06/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09-596,892

Applicant(s)

CHOW ET AL.

Examiner

VANOY

Group Art Unit

1754

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- ☒ Responsive to communication(s) dated 12/8/00 filed on _____.
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-22 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-22 is/are rejected.
- ☒ Claim(s) 1-22 is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☒ The specification is objected to by the Examiner.
- ☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.
- ☐ received in Application No. (Series Code/Serial Number) _____.
- ☐ received in this national stage application from the International Bureau (PCT Rule 1 7.2(a)).

*Certified copies not received: _____.

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☒ Notice of Reference(s) Cited, PTO-892
- ☒ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

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DETAILED ACTION

Information Disclosure Statement

a) The Letter titled "Information Disclosure Statement – Remarks" dated 12/8/00 which states that a completed Form PTO-SB-08A is attached (thereto), and that the required comments on the prior art follow is noted and is present in this application file: However, this application does not contain the following items mentioned (or, alternatively, implied as being present) in said Letter dated 12/8/00:

- i) The Information Disclosure Statement; the PTO-1449 and the references cited on the PTO-1449;
- ii) The PTO Form SB-08A, and
- iii) The Applicants' comments on the prior art.

A copy of each of these missing items is respectfully requested to complete this application file.

Oath/Declaration

The Applicant has not given a post office address anywhere in the application papers as required by 37 C.F.R. 1.33(a), which was in effect at the time of filing of the oath or declaration. A statement over the Applicant's signature providing a complete post office address is required.

Drawings

- a) The specification is objected to because it does not provide a brief description of Fig. 3A in the Brief Description of the Drawings set forth on pg. 6.

Specification

- a) In line 1 in the abstract, "novel" should be deleted.
- b) The abstract is objected to because it does not give any examples of the "Selective oxidation catalyst" and the "Claus reaction catalyst".
- c) The abstract is objected because it does not provide a concise and clear description of the Applicants' process in as much as no particular process steps have been described in a particular sequence. It is suggested to revise the abstract to briefly describe the Applicants' process by concisely describing the process steps that the treat the gas.
- d) The abstract is objected to because it makes disparaging remarks about the prior art, i. e. "The prior art fails . . .".
- e) In the abstract, it is not entirely clear if the Applicant's modification to the prior art sulfur recovery processes can be used for *all possible* prior art sulfur recovery processes, or just the *specific* prior art process set forth in U. S. Pat. 5,294,428 mentioned on pg. 7 Ins. 24-26.
- f) The use of the trademark "Selectox" set forth on pg. 7 ln. 28 has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

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Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

- g) The status of 09-157,467 set forth on pg. 10 ln. 31 and on pg. 14 ln. 17 in the specification should be updated.
- h) The application is objected to because the *handwritten* numbering of pg. 18 has not been initialed and/or dated as is required by 37 CFR 1.52(c).
- i) Throughout the specification, the numbers in *all* of the empirical chemical formulas should be subscripted. For example, on pg. 1 ln. 9, the "2" in "H2S" should be subscripted.

Claim Objections

- a) In claim 1 ln. 5; claim 2 ln. 5; claim 21 ln. 5 and claim 22 ln. 5, it appears that "at" should be replaced with --containing--.
- b) In claim 1 ln. 8; claim 2 ln. 8; claim 21 ln. 8 and claim 22 ln. 8, it appears that --stage-- should be inserted between "thermal" and "to".
- c) In claim 1 ln. 3, it appears that --a-- should be inserted between "comprise" and "selective".
- d) In claim 8 ln. 4, it would suffice to simply recite --attains-- in lieu of "is permitted to attain".
- e) In claim 9 ln. 1, "sequentially" should be replaced with "sequential".

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f) Claim 21 is objected to for being a functional duplicate of claim 1 in as much as the same process will inherently result in the same capacity expansion set forth in step d of claim 21. Similarly, claim 22 is objected to for being a functional duplicate of claim 2 for the same reason.

g) Throughout the claims, the numbers in *all* of the empirical chemical formulas should be subscripted. For example, in claim 1 ln. 4, the "2" in "H2S" should be subscripted.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention.

a) Claim 8 does not particularly point out and distinctly set forth which "existing sulfur recovery unit" is used in the Applicant's process. It is not entirely clear if the Applicant's process can be retrofitted to all possible sulfur recovery units in the manner in which the Applicants' claims seem to suggest or only to the prior art process of U. S. Pat. 5,294,428 mentioned on pg. 7 lns. 24-26 in the Applicant's specification.

b) Claim 8 does not particularly point out and distinctly set forth what the "pressure vessel" is and how (if at all) it differs from any of the other vessels or units in the sulfur recovery process.

- c) Claim 9 does not particularly point out and distinctly set forth what the "separator/condenser" separates and/or condenses?
- d) Claim 15 does not particularly point out and distinctly set forth what the Claus reaction catalyst; hydrogenation catalyst and SO₂ reduction catalyst are and how they are distinct from each other.
- e) None of the claims particularly point out and distinctly set forth what the "mid-location catalytic stages" are midway between.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The person "having ordinary skill in the art" has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

Claims 1-18 and 20-22 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U. S. Pat. 6,214,311 B1 to Kwong.

The Kwong patent describes what appears to be the same process for treating the effluent from the thermal stage of a Claus-type sulfur recovery process, comprising the steps:

Feeding the hydrogen sulfide-containing gas together with a process air stream into a burner within the thermal stage so that a portion of the hydrogen sulfide is oxidized into elemental sulfur (please see col. 4 Ins. 9-16 and col. 7 Ins. 15-23);

Passing the effluent derived from the thermal stage into one of more selective catalytic oxidation stages (with process air, oxygen-enriched air or oxygen) so that the hydrogen sulfide is selectively oxidized into elemental sulfur (please see "step 4" in col. 4 Ins. 26-30; col. 5 Ins. 6-13 and col. 12 ln. 63-66).

Note that col. 12 ln. 64 reports that only a "sufficient" amount of air was used for the hydrogen sulfide oxidation, in a manner that is not seen to be distinct from the "controlled by limiting the amount of oxygen" limitation of Applicants' claim 7.

Note that the gas is heated before injection into the selective catalytic oxidation stages and the gas from the selective catalytic oxidation stages is condensed (please see col. 12 ln. 63 and col. 13 ln. 1), in a manner that is not seen to be distinct from the limitations of Applicant's claim 9.

Note that col. 13 lns. 59-65 reports that gas exiting the selective catalytic oxidation stages may be subjected to a "catalytic combustion" before release into the atmosphere, in a manner that is not seen to be distinct from the "Claus reaction catalyst" limitations of Applicant's claims 13 and 15-18.

Note that col. 13 lns. 1-3 reports that the gas exiting the selective catalytic oxidation stages contains only 0.05 mole percent hydrogen sulfide and 0.08 mole percent sulfur dioxide (after condensation), in a manner that is submitted to meet the limitations of Applicant's claim 14.

The limitations of Applicant's claim 20 are noted, but it is submitted that the same process (and/or obvious variation thereof) will inherently exhibit the same capacity increase reported in claim 20.

The differences between the Applicants' claims and the Kwong patent is that the Applicants' claims 1, 2, 3, 21 and 22 further describe the hydrogen sulfide content in the gas to be treated in their "mid-location catalytic stages" (corresponding to the "one or more catalytic stages" set forth in step 4 in col. 4 lns. 26-29 in the Kwong patent) and

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also describes the oxygen content in the oxygen containing gas used in the burner in the thermal stage; Applicants' claims 4-6 describe the content of non-elemental sulfur components present in the tail gas (corresponding to the effluent exiting the "one or more catalytic stages" set forth in step 4 in col. 4 lns. 26-29 in the Kwong patent) and Applicants' claim 8 describes the relative temperature the gas exiting the bed of the selective oxidation catalyst, however it is submitted that these differences would have been obvious to one of ordinary skill in the art at the time the invention was made because it is submitted to be within the skill level of the person having ordinary skill in the art to readily determine what temperatures, concentrations, etc. were used in the process of U. S. Pat. 6,214,311 B1 described above. Since no perceptible differences are seen or have been shown, these claims are rejected under 35 USC 102 (as well as 35 USC 103).

Claim 19 has not been rejected under either 35 USC 102 or 35 USC 103 because none of the references of record teach or suggest the claimed mixture of two or more catalysts wherein one of the catalysts is the selective oxidation catalyst.

The following references, which are indicative of the state of the art, are made of record:

U. S. Pat. 6,099,819 disclosing catalysts for the selective oxidation of hydrogen sulfide to sulfur;

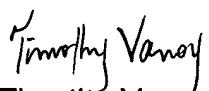
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U. S. Pat. 6,083,473 disclosing the a selective oxidation catalyst which contains a Group VIII metal for the oxidation of sulfur containing compounds;

U. S. Pat. 5,948,382 disclosing the use of a mixed oxide catalyst for the selective oxidation of hydrogen sulfide, and

U. S. Pat. 5,294,428 disclosing a double combustion oxygen enhanced sulfur recovery process.

Any inquiry concerning this communication should be directed to Timothy C. Vanoy at telephone number 703-308-2540.

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|------------------|--|
| Timothy Vanoy/tv |  Timothy Vandy |
| Aug. 3, 2001 | Patent Examiner |
| | Art Unit 1754 |